

WHAT IS CLAIMED IS:

1. A multi-stage vacuum pump comprising:

a plurality of casings axially connected in series, said casings each defining a compression chamber inside thereof;

5 a plurality of partition plates each respectively mounted between two adjacent casings of said casings to separate the compression chambers of said two adjacent casings, said partition plates each having a predetermined wall thickness and two through holes;

a mover module, said mover module comprising two parallel shafts
10 respectively extended through the two through holes of each of said partition plates, and a plurality of rotors symmetrically formed integral with said two parallel shafts respectively and arranged in pairs, wherein each pair of two adjacent rotors of said rotors received in one corresponding compression chamber of said casings; and

15 a synchronizer gear module adapted to rotate said shafts and said rotors synchronously;

wherein said partition plates each have a front face, a rear face, and at least one air path respectively formed in the respective wall thickness and extended from said front face to said rear face.

20 2. The multi-stage vacuum pump as claimed in claim 1, wherein said partition plates each are comprised of a left partition plate member and a right partition plate member, said left partition plate member and said right partition plate member being abutted against each other, said left partition plate member defining a left air path, said right partition plate

member defining a right air path, said left air path and said right air path being linked to form one air path of the respective partition plate.

3. The multi-stage vacuum pump as claimed in claim 1, wherein the at least one air path of each said partition plate is formed in between the two
5 through holes of the respective partition plate.

4. The multi-stage vacuum pump as claimed in claim 1, wherein the at least one air path of each said partition plate is formed surrounding the through holes of the respective partition plate.

5. The multi-stage vacuum pump as claimed in claim 1, wherein
10 said partition plates each further have an annular groove, and an annular elastomer respectively mounted in said annular groove and pressed on the corresponding casing to seal the compression chamber of the corresponding casing.

6. The multi-stage vacuum pump as claimed in claim 1, wherein
15 said partition plates each are comprised of a first partition plate member, a second partition plate member, and a third partition plate member, said first partition plate member and said second partition plate member and said third partition plate member being abutted against one another.

7. The multi-stage vacuum pump as claimed in claim 1, wherein
20 said partition plates each have a front opening in the respective front face, and a rear opening in the respective rear face in air-communication with said front opening through the at least one air path of the respective partition plate.

8. The multi-stage vacuum pump as claimed in claim 1, wherein

said partition plates each are comprised of four partition plate members abutted against one another.

9. The multi-stage vacuum pump as claimed in claim 1, wherein said synchronizer gear module drives said rotors and said shafts to rotate
5 synchronously without causing contact between each two adjacent rotors.

10. The multi-stage vacuum pump as claimed in claim 7, wherein the front opening of each of said partition plates adapted to guide air into the at least one air path of the respective partition plate, and the rear opening of each of said partition plates adapted to guide air out of the at least one air
10 path of the respective partition plate.